Docket No.: 215150US0

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: :

Gottlieb-Georg LINDNER, et al. : EXAMINER: NGUYEN, N. Y. M.

SERIAL NO.: 10/079,479 :

FILED: FEBRUARY 22, 2002 : GROUP ART UNIT: 1754

FOR: SILICA AND SILICATE BY PRECIPITATION AT CONSTANT ALKALI NUMBER, AND ITS USE

DECLARATION UNDER 37 C.F.R.§1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VA 22313-1450

SIR:

Now comes Dr Gottlieb J. Lindner who deposes and states that:

1. That I am an inventor of the above-identified application.

2. That I am a graduate of University of Marburg, Germany, and received my PhD degree in the field of chemistry, in the year 1994.

3. That I have been employed by Degussa AG, for 6 years as Manager R&D in the field of precipitated silicas.

4. That I understand the English language or, at least, that the contents of the Declaration were made clear to me prior to executing the same.

5. That the process disclosed by Turk is not essentially the same as in the present invention as alleged by the Examiner for two essential reasons:

a) Shearing force

The essential step of the process of Turk comprises the application of high shearing forces. As specifically disclosed at column 4, lines 19 – 25, Turk recites that his process

comprises a step, "wherein during this process a shearing force is applied to the reaction mass, specifically during the alkaline phase of the precipitation reaction *by passing the reaction mass* in a continuous flow *through* a dispersing device and wherein the dispersing device is operated with an hourly throughput frequency from at least 10 h^{-1}.... ".

Therefore, the process disclosed by Turk requires an external – outside of the precipitation tank – shearing pump (see Fig. 3, Turk). Turk uses a dispersing pump, rotary pump, side-channel pump or a combination thereof as a shearing pump (see column 4, lines 47 - 54).

The influence of the shearing force to the process of Turk is described in column 5, lines 22 - 28 and column 6, lines 15 - 22 and especially in column. 10, lines 52 – 57, where Turk states "the requirement of obtaining high DBP number values (structure) *is in the first place use of a sufficient shearing force in the precipitation phase*" (column. 10, lines 54 - 57).

Turk also states in column 5, lines 59 - 62 that "all of the last-mentioned structure increase due to precipitation conditions are effective *only* if they are employed in combination with the previously discussed mechanical dispersing conditions".

Therefore, the essential aspect of the process of Turk is the application of *very high shearing forces during the precipitation.* Said very high shearing forces are mainly responsible for the high structure (DBP) of the silica of Turk. To ensure the very high shearing forces the process of Turk requires the use of special equipment namely (external) dispersing pumps.

The process of the present invention differs from the process of Turk in that no respectively very low shearing forces (agitator) were employed during the precipitation step. As may be seen on page 5, lines 15 - 24 of the invention, where *no* shearing device was

employed during the process of the present invention. Consequently, the silica of the invention cannot be identical to that of Turk (see Turk, column 5, lines 59 - 63).

b) Drying

The process of the invention comprises preferably spray drying (see Tables on page 7 and 9). Turk, however, teaches that spray dried silica show worse performance compared to the *fine* dispersion disclosed therein (see Turk, column 6, lines 45 - 48). Consequently, the process of Turk leads to more finely divided silica while the silica of the present invention are made by a process that leads to much coarser products.

c) Summary of the process parameters

- The process of Turk requires high (external) shear forces while the process of the present invention is carried out without an external shearing device and without high shearing forces.

- The process of the invention comprises preferably a spray-drying step while Turk teaches that spray-dried products are disadvantageous.

Therefore, there is no expectation that the process disclosed by Turk would result in the products of the present invention.

6. That the following experiments were conducted to show that the aforementioned differences between the methods disclosed by Turk and the present invention results in distinct products.

Turk discloses in Example 26 a choline chloride absorption test. Unfortunately, the silica of Turk were not available of comparison tests. Therefore, Applicants have selected two silicas disclosed in the present invention to be used in the method disclosed in Example 26 of Turk to compare the choline chloride absorption of the silica of Turk with the silica of the

present invention. To this end, the experiments were carried out as described in Example 26 of Turk using a common household mixer.

In comparison Example 1, silica No. 5 (TV 7397) of the invention (see Tables on page 9 and 10) was employed. In comparison Example 2, a silica named EP 118888 was tested. EXP 118888 was manufactured according to the process of the invention at alkaline number 28, in batch scale.

The results of the tests are enclosed in the following Table:

Silica	**DBP**	**consumption of 70% aq. sol. of choline chloride**
Example 1 of Turk (Turk, col. 20, line 19)	284 ml/100 g	43,4 ml
Example 22 of Turk (Turk, col. 20, line 25)	?	48,2 ml
TV 7397 (Ex. 5 of the invention)	247 g/100 g =237 ml/100 g*	52 ml
EXP 118888	300 g/100 g =287 ml/100 g*	59 ml

*) recalculated usual density 1.043 g/cm^3 for DBP

As evidenced by the Table above the choline chloride absorption of TV 7397 is about 22 % larger than that of Ex. 1 of Turk and 7.9 % larger than that of Ex. 22 of Turk. This is an enormous improvement especially because the silica of Ex. 1 of Turk exhibits a DBP of 284 ml/100 g (Table 1 of Turk) while TV 7397 exhibits a DBP of 247 g/100 g = 237 ml/100 g (see Table on page 10 of the invention). Therefore, even though TV 7397 has a lower DBP absorption, it has a 22% higher choline chloride absorption compared to Example 1 of Turk.

More specifically, TV 7397 exhibits a DBP/choline chloride-ratio (DBP/CC-ratio) of 1.0601 (see Table on page 10 of the description). TV 7397 is therefore with respect to the

DBP/CC-ratio the worst Example of all Examples of the present invention. Consequently, we compared the worst Example of the invention with the silica of Turk. Nevertheless, the silica of Turk exhibit 22% and 7.9% less choline chloride absorption, respectively, than the worst silica of the invention (TV 7397).

The choline chloride absorption stands in the denominator of the DBP/CC-ratio. Consequently a lower choline chloride absorption results by force in a higher DBP/CC-ratio. TV 7397 (the worst Example of the invention) has a DBP/CC-ratio of 1.0601. The scope of the DBP/CC-ratio in Claim 1 of the present invention is < 1.07 which is very close to the value of TV 7397.

However, according to the comparison experiments above, the silica of Example 1 of Turk exhibits a choline chloride absorption 22% lower than that of TV 7397. Thus the DBP/CC-ratio must be 22% higher, *i. e.* the DBP/CC-ratio of the silica of Example 1 of Turk is about 1.29 (1.0601 x 122%). The choline chloride absorption of Example 22 of Turk is 7.9% lower compared to TV 7397. Thus the DBP/CC-ratio must be 7.9% higher, *i. e.* the DBP/CC-ratio of the silica of Example 22 of Turk is about 1.13 (1.0601 x 107.9%). Therefore, the present experiments clearly demonstrate that the silica disclosed by Turk exhibit a DBP/CC-ratio far outside of the scope of Claim 1 of the present invention. For the Examiner's convenience, these results are summarized in the Table below:

Silica	CC-absorption determined according to Example 26 of Turk	Difference to TV 7397	DBP/CC-ration calculated as follows: (DBP/CC-ratio of TV 7397) × (Diff. Of CC-absorption in %)
Example 1 of Turk	43.4 ml	22%	1.2933 (calculated)
Example 22 of Turk	48.2 ml	7.9%	1.1438 (calculated)
TV 7397 (Ex. 5 of present invention	52 ml	--	1.0601 (see page 19 of present application)

The results set forth herein constitute an unexpected modification in the process of Turk in that the improved process resulted in silicas that show a much better performance as absorbers and carriers. Thus new products obtained by the claimed method might substitute older products made by the process of Turk in commercial applications.

7. I declare further that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

8. Further Declarant saith not.

Dr. Johnj. Kl

Name:

16.09.2004

Date